

This listing of claims will replace all prior versions and listings of the claims in the application:

In the Claims:

1. (Previously presented) The method of Claim 43 wherein the headgear unit includes a plurality of microphones thereon, the method including:
 - detecting a sound signal from the plurality of microphones; and
 - applying a transfer function to the sound signal to provide a transformed sound signal, the transformed sound signal providing an approximation of free field hearing sound at a subject's ear inside the headgear unit.
2. (Original) The method of Claim 1, wherein the transfer function is based on an experimentally determined propagation effect from sound propagating to an opening of an ear canal and substantially omitting propagation interference from the headgear unit.
3. (Original) The method of Claim 1, further comprising generating sound inside the headgear unit responsive to the transformed sound signal.
4. (Original) The method of Claim 1, wherein the headgear unit comprises a protective helmet.
5. (Original) The method of Claim 1, wherein the plurality of microphones are positioned at locations on the headgear unit, the locations being selected to provide sufficient sound information to provide an approximation of free field hearing sound.
6. (Original) The method of Claim 1, wherein applying a transfer function further comprises reducing the amplitude of a portion of the sound signal if the amplitude is higher than a threshold level.

7. (Original) The method of Claim 1, wherein applying a transfer function further comprises canceling the amplitude of portions of sound signals.

8. (Cancelled).

9. (Original) The method of Claim 1, wherein the headgear unit is substantially sound-proof in a frequency range.

10. (Cancelled).

11. (Currently amended) A device for generating a directional sound environment, the device comprising:

a headgear unit;

a pinna on an outer surface of the headgear unit, wherein the pinna approximates the shape of a human pinna;

a microphone positioned adjacent the pinna; and

a speaker positioned in an interior of the headgear unit, wherein the microphone is configured to receive a sound signal and the speaker is configured to generate sound inside the headgear unit;

wherein the pinna has a filtering surface and serves as an analog filter to provide filtered sound to the microphone, the filtered sound being a representation of natural hearing approximating hearing cues a wearer of the headgear unit would receive naturally with the unaided ear when not wearing the headgear unit.

12. (Original) The device of Claim 11, wherein the device further comprises a processor configured to apply a transfer function to the received sound signal to provide a transformed sound signal, the transformed sound signal providing an approximation of free field hearing sound at a subject's ear inside the headgear unit.

13. (Original) The device of Claim 12, wherein the transfer function is based on an experimentally determined propagation effect from sound propagating to an opening of an ear canal and substantially omitting propagation interference from the headgear unit.

14. (Previously Presented) The device of Claim 12, including a plurality of microphones positioned at locations on the headgear unit, the locations being selected to provide sufficient sound information to provide an approximation of free field hearing sound.

15. (Original) The device of Claim 12, wherein the processor is further configured to reduce an amplitude of a portion of the sound signal if the amplitude is higher than a threshold level.

16. (Original) The device of Claim 12, wherein the processor is further configured to cancel the amplitude of a portion of the sound signal.

17. (Original) The device of Claim 12, wherein the headgear unit comprises a helmet.

18. (Original) The device of Claim 11, wherein the headgear unit is substantially sound-proof in a frequency range.

19-22. (Cancelled).

23. (Previously presented) The device of Claim 12, wherein the processor is further configured to cancel the amplitude of selected sound signals.

24-36. (Cancelled).

37. (Currently amended) The device of Claim 11, wherein the pinna approximates has the shape of a human ear.

38. (Currently amended) The device of Claim ~~[[37]]~~ 11, including an earphone including an in-ear portion, wherein the speaker is configured to generate sound through the in-ear portion.

39. (Currently amended) The device of Claim ~~[[37]]~~ 11, wherein the pinna approximates the shape of an average human ear.

40. (Currently amended) The device of Claim ~~[[37]]~~ 11, wherein the pinna approximates the shape of an ear of an individual intended to wear the headgear unit.

41. (Previously Presented) The device of Claim 40, including an earphone including an in-ear portion, wherein the speaker is configured to generate sound through the in-ear portion.

42. (Previously Presented) The device of Claim 11, including an earphone including an in-ear portion, wherein the speaker is configured to generate sound through the in-ear portion.

43. (Currently amended) A method for generating a directional sound environment, the method comprising:

providing a device including:

a headgear unit;

a pinna on an outer surface of the headgear unit, wherein the pinna approximates the shape of a human pinna;

a microphone positioned adjacent the pinna; and

a speaker positioned on an interior of the headgear unit;

detecting a sound signal from the microphone; and

generating sound inside the headgear unit from the speaker;

wherein the pinna has a filtering surface and serves as an analog filter to provide filtered sound to the microphone, the filtered sound being a representation of natural hearing approximating hearing cues a wearer of the headgear unit would receive naturally with the unaided ear when not wearing the headgear unit.

44. (Currently amended) The method of Claim 43, wherein the pinna ~~approximates~~ has the shape of a human ear.

45. (Currently amended) The method of Claim ~~[[44]]~~ 43, including an earphone including an in-ear portion, wherein the speaker is configured to generate sound through the in-ear portion.

46. (Currently amended) The method of Claim ~~[[44]]~~ 43, wherein the pinna approximates the shape of an average human ear.

47. (Currently amended) The method of Claim ~~[[44]]~~ 43, wherein the pinna approximates the shape of an ear of a specific individual intended to wear the headgear unit.

48. (Previously Presented) The method of Claim 47, including an earphone including an in-ear portion, wherein the speaker is configured to generate sound through the in-ear portion.

49. (Previously Presented) The method of Claim 47, including measuring the ear of the specific individual and producing the pinna as a replica of the ear of the individual.

50. (Previously Presented) The method of Claim 47, including optically scanning the ear of the specific individual and producing the pinna as a replica of the ear of

the individual.

51. (Previously Presented) The method of Claim 43, wherein the device includes an earphone including an in-ear portion, the method including mounting the in-ear portion in a user's ear and generating sound from the speaker through the in-ear portion.

52. (Previously Presented) A method for generating a directional sound environment, the method comprising:

providing a device including:

a headgear unit;

a pinna on an outer surface of the headgear unit, wherein the pinna approximates the shape of a human ear, wherein the pinna approximates the shape of an ear of a specific individual intended to wear the headgear unit;

a microphone positioned adjacent the pinna; and

a speaker positioned on an interior of the headgear unit;

detecting a sound signal from the microphone; and

generating sound inside the headgear unit from the speaker;

and

measuring the ear of the specific individual and producing the pinna as a replica of the ear of the individual.

53. (Previously Presented) A method for generating a directional sound environment, the method comprising:

providing a device including:

a headgear unit;

a pinna on an outer surface of the headgear unit, wherein the pinna approximates the shape of a human ear, wherein the pinna approximates the shape of an ear of a specific individual intended to wear the headgear unit;

a microphone positioned adjacent the pinna; and

a speaker positioned on an interior of the headgear unit;

detecting a sound signal from the microphone; and
generating sound inside the headgear unit from the speaker; and
optically scanning the ear of the specific individual and producing the pinna as
a replica of the ear of the individual.

54. (Currently amended) The device of Claim 11 further including:
a second pinna on the outer surface of the headgear unit opposite the first
pinna, wherein the second pinna approximates the shape of a human pinna;
a second microphone positioned adjacent the second pinna; and
a second speaker positioned in the interior of the headgear unit, wherein the
second microphone is configured to receive a sound signal and the second speaker is
configured to generate sound inside the headgear unit;
wherein the second pinna has a filtering surface and serves as an analog filter
to provide filtered sound to the second microphone, the filtered sound being a
representation of natural hearing approximating hearing cues a wearer of the headgear
unit would receive naturally with the unaided ear when not wearing the headgear unit.

55. (Currently amended) The method of Claim 43 wherein the device further
includes:
a second pinna on the outer surface of the headgear unit opposite the first
pinna, wherein the pinna approximates the shape of a human pinna;
a second microphone positioned adjacent the second pinna; and
a second speaker positioned in the interior of the headgear unit, wherein the
second microphone is configured to receive a sound signal and the second speaker is
configured to generate sound inside the headgear unit;
wherein the second pinna has a filtering surface and serves as an analog filter
to provide filtered sound to the second microphone, the filtered sound being a
representation of natural hearing approximating hearing cues a wearer of the headgear
unit would receive naturally with the unaided ear when not wearing the headgear unit.